

COMPREHENSIVE SITE INVESTIGATION REPORT

**76TH & PARNELL (NORTH PARCEL),
519-555 WEST 76TH STREET, CHICAGO, ILLINOIS
LPC# 0316715176
CHICAGO/SAFE HOME FOR CHILDREN – PARNELL
SITE REMEDIATION/TECHNICAL REPORTS**

Prepared for:

**CITY OF CHICAGO
DEPARTMENT OF ENVIRONMENT
DIVISION OF URBAN MANAGEMENT AND BROWNFIELD REDEVELOPMENT**

Prepared by:

**CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.
CHICAGO, ILLINOIS**

December 31, 2002



ENGINEERS

CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.

LETTER OF TRANSMITTAL

303 EAST WACKER DRIVE • SUITE 600 • CHICAGO, ILLINOIS 60601 • (312) 938-0300 • FAX (312) 861-4152

To: Illinois Environmental Protection Agency

Bureau of Land, RPMS, SRP

1021 N. Grand Avenue East

Mail Code 24

Springfield, Illinois 62702

Attn: Mr. Steve McCaslin

Site Remediation Program

Date: 01/07/03

Job CTE Project 44476-0008

No.:

Re: Safe Home for Children – Parnell (North Parcel)

519-555 West 76th Street, Chicago, IL

We are sending:

☐ plans

☒ originals

☐ other

☐ specifications

☐ shop drawings

These are transmitted:

☐ for your use

☐ as requested

☐ other

☒ for your approval

☒ for review/comment

Copies Date Description

| | | |
|---|--|--|
| 2 | | DRM-2 Form (1 original, 1 copy) |
| 2 | | Comprehensive Site Investigation Report – 76 th & Parnell (North Parcel), |
| | | dated December 31, 2002 |
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Remarks:

Consoer Townsend Envirodyne Engineers, Inc. (CTE), has submitted the enclosed items on behalf of Ms. Annalisa Ahumada (312-742-0756) of the City of Chicago, Department of Environment (DOE).

Feel free to also contact me directly at 312-861-4136 if you have any questions or comments.
Thank you.

By: David Russian

cc: Ms. Annalisa Ahumada, Chicago DOE
CTE Project File

Site Remediation Program Form (DRM-2)
(To Be Submitted with all Plans and Reports)

I. Site Identification:

Site Name: Safe Home for Children-Parnell (North Parcel)

Street Address: 519-555 West 76th Street

City: Chicago

Illinois Inventory I. D. Number: _____

IEMA Incident Number: _____

II. Remediation Applicant:

Applicant's Name: Kimberly Worthington, as agent for Company: City of Chicago, Department of Environment

Street Address: 30 North LaSalle Street

City: Chicago

State: IL

ZIP Code: 60602

Phone: 312-744-7606

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: Kimberly Worthington

Date: 1/7/03

III. Contact Person:

Contact's Name: Kimberly Worthington

Company: City of Chicago, Department of Environment

Street Address: 30 North LaSalle Street

City: Chicago

State: IL

ZIP Code: 60602

Phone: 312-744-7606

IV. Review & Evaluation Licensed Professional Engineer or Geologist ("RELPEG"), if applicable:

RELPEG's Name: NA

Company: _____

Street Address: _____

City: _____

State: _____

ZIP Code: _____

Phone: _____

Registration Number: _____

License Expiration Date: _____

All information submitted is available to the public except when specifically requested by the Remediation Applicant to be treated confidentially as a trade secret or secret process in accordance with the Illinois Compiled Statutes, Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines. The Illinois EPA is authorized to require this information under Sections 415 ILCS 5/58 - 58.12 of the Environmental Protection Act and regulations promulgated thereunder. Disclosure of this information is required as a condition of participation in the Site Remediation Program. Failure to do so may prevent this form from being processed and could result in your plan(s) or report(s) being rejected. This form has been approved by the Forms Management Center.

V. Project Documents Being Submitted:

| | |
|---|---|
| Document Title: <u>76th & Parnell (North Parcel)</u> | Date of Preparation of Plan or Report: <u>December 31, 2002</u> |
| Prepared by: <u>Consoer Townsend Envirodyne Engineers, Inc.</u> | Prepared for: <u>City of Chicago, Department of Environment</u> |
| <u>Type of Document Submitted:</u> | |
| <input checked="" type="checkbox"/> Site Investigation Report - Comprehensive | Sampling Plan |
| Site Investigation Report - Focused | Health and Safety Plan |
| Remediation Objectives Report-Tier 1 or 2 | Community Relations Plan |
| Remediation Objectives Report-Tier 3 | Risk Assessment |
| Remedial Action Plan | Contaminant Fate & Transport Modeling |
| Remedial Action Completion Report | Environmental Remediation Tax Credit - Budget Plan Review |
| | Other: _____ |

| | |
|---|---|
| Document Title: <u>NA</u> | Date of Preparation of Plan or Report: _____ |
| Prepared by: _____ | Prepared for: _____ |
| <u>Type of Document Submitted:</u> | |
| Site Investigation Report - Comprehensive | Sampling Plan |
| Site Investigation Report - Focused | Health and Safety Plan |
| Remediation Objectives Report-Tier 1 or 2 | Community Relations Plan |
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| Remedial Action Plan | Contaminant Fate & Transport Modeling |
| Remedial Action Completion Report | Environmental Remediation Tax Credit - Budget Plan Review |
| | Other: _____ |

VI. Professional Engineer's or Geologist's Seal or Stamp:

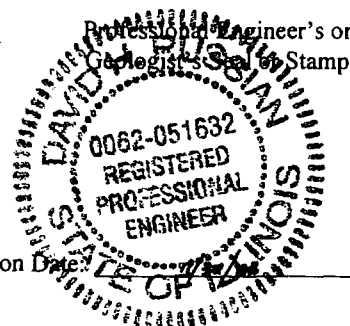
I attest that all site investigations or remedial activities that are the subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by me, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

Engineer or Geologist Name: David H. Russian

Company: Consoer Townsend Envirodyne Engineers, Inc. Phone: 312-938-0300

Registration Number: 062-051632

Signature:  License Expiration Date: _____



Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002). A Licensed Professional Geologist cannot certify Remediation Objectives Reports, Remedial Action Plans or Remedial Action Completion Reports.

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CHICAGO, ILLINOIS**

December 31, 2002

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EXECUTIVE SUMMARY

76th & Parnell (North Parcel) 519-555 West 76th Street, Chicago, IL 60609

The City of Chicago, Department of Environment (DOE) engaged Consoer Townsend Envirodyne Engineers, Inc. (CTE) to conduct a Comprehensive Site Investigation (CSI) for the approximate 4.5-acre subject property located between 519 West 76th Street and 555 West 76th Street in Chicago, Illinois, commonly referred to as '76th & Parnell' (North Parcel). Figure 1 and Figure 2 indicate the location of the subject property and the subject property's surrounding land uses, respectively.

DOE is seeking a comprehensive No Further Remediation (NFR) letter from the Illinois Environmental Protection Agency (IEPA), Site Remediation Program (SRP) for the subject property based upon their plans to redevelop the subject property for residential land use.

CTE completed a CSI Report (CSIR) dated July 31, 2002, which was submitted to the IEPA SRP. Mr. Steve McCaslin with the IEPA SRP responded with a letter dated October 15, 2002. Since then, DOE decided to divide the overall approximate 7-acre contiguous property into two properties: (1) 76th & Parnell (Northern Parcel), which is approximately 4.5 acres, and; 76th & Parnell (Southern Parcel), which is approximately 2 acres. DOE intends separately enter the 76th & Parnell (Southern Parcel) site with the SRP. Section 1.5 presents a revised legal description for the subject property. Also, additional site investigation has been conducted since July 2002. Documentation of the additional site investigation presented herein does address SRP's comments pertaining to the subject property, as outlined in their October 15, 2002 letter. Therefore, this report supercedes CTE's previous CSIR dated July 31, 2002.

This CSIR, which summarizes the environmental assessment activities conducted on the subject property by CTE, presents an endangerment assessment and CTE's findings and conclusions.

The objectives of CTE's site investigations were to assess and delineate recognized environmental conditions (RECs), areas of environmental concern (AOECs) and contaminants of concern (COCs) identified on the subject property as a result of the prior Phase I Environmental Site Assessment (ESA). DOE and CTE are not aware of other prior environmental site assessment activities having been performed on the subject property.

The technical approach for the CSI utilized included standard methods, processes and guidelines, including American Standards of Testing and Materials (ASTM) processes, United States Environmental Protection Agency (USEPA) methods, IEPA Tiered Approach to Corrective Action Objectives (TACO) guidelines and procedures standard to those practiced by

reputable members of CTE's profession under similar conditions in the same or similar locality at the time of service.

The subject property has a history of being utilized by various manufacturing, warehouse and commercial uses for over 100 years. The Phase I ESA report identified numerous RECs and AOECs associated with the subject property's historical use. Section 1.1.2 presents a summary of the RECs and AOECs identified within CTE's Phase I ESA. Section 1.2 summarizes the site-history as presented in CTE's Phase I ESA.

The findings contained within this CSIR address the requirements of Title 35 IAC Part 740.415, 740.420 and 740.425. The CSIR's findings also address the SRP's comments pertaining to the subject property as outlined in their October 15, 2002 letter. Except for the on-going additional site investigation for total lead and leachable lead in the shallow subsurface, CTE considers the CSI for the subject property to be complete. DOE will follow up on this investigation with an addendum to be submitted to IEPA at a future date.

Specific conclusions include the following:

- Historical and Suspect USTs – Results of soil sample analyses, EM Survey and test pit excavations suggest that no significant impacts from former on-site USTs are present and that no USTs remain on-site.

If any evidence of USTs or impacts from USTs is discovered during site development, DOE will collect soil samples and conduct the appropriate removal as necessary.

- Former Site Operations – Section 1.0 of the CSIR describe the numerous historical on-site manufacturing and warehousing operations that occurred on-site for more than 100 years as identified in CTE's Report of Phase I ESA. CTE advanced over 50 soil borings and submitted over 100 soil samples for laboratory analysis of targeted and comprehensive chemical analyses within the footprint of and/or in the immediate vicinity of former on-site industrial operations, RECs and AOECs.

Laboratory analyses of soil samples included the comprehensive list of constituents (as stated Title 35 IAC Part 740. Appendix A), including metals and other COCs.

Select VOCs, SVOCs, total arsenic, total lead and leachable lead concentrations above the Tier 1 Ingestion, inhalation, Soil Component of the Groundwater Ingestion Exposure Route (SCGIR) remediation objectives for residential property use and/or Construction Worker remediation objectives. Areas of elevated VOC impacts (i.e., above Inhalation remediation objectives) were horizontally and vertically defined, as were all other non-volatile COCs detected on-site.

Since future construction/re-development activities will be conducted on the subject property, CTE recommends that the subject property owner notify the re-development contractor of the results of these findings so that worker protection precautions may be taken.

- Groundwater – Five groundwater samples were collected to address the identified RECs and AOECs associated with the subject property. Laboratory results of one groundwater sample (SB-24/GW-2) indicated the presence of an elevated concentration of one VOC (1,2-Dichloroethane). 1,2-Dichloroethane was detected at a concentration of 0.017 mg/L, which is above its Class I groundwater remediation objective of 0.005 mg/L and below its Class II groundwater remediation objective of 0.025 mg/L.

CTE concludes that characterization of COCs in groundwater for the identified RECs and AOECs associated with the northern portion of the subject property has been completed. Groundwater in the vicinity of the subject property is not used as a source of drinking, therefore, it is anticipated that the groundwater ingestion exposure route will be eliminated in the Remediation Objectives Report (ROR).

SRP's October 15, 2002 comments pertaining to the "South Parcel" will be addressed in a separate CSIR, as DOE intends to register the "South Parcel" as a separate Remediation Site with the SRP. DOE has engaged CSI and remediation efforts for the South Parcel, which are in progress. Several RECs and AOECs were identified on the South Parcel in CTE's Phase I ESA, however, no RECs or AOECs identified on the South Parcel are considered to be RECs or AOECs to the subject property.

While the executive summary is an integral part of this report, it is presented only for the reader's convenience. It should not be used in lieu of reading the entire report. The reader is expected to read the text of the report for interpretive discussions relevant to CTE's findings and conclusions.

1.0 SITE CHARACTERIZATION

1.1 SOURCES REVIEWED/HISTORICAL ASSESSMENT INFORMATION

1.1.1 Background/Phase I ESA

DOE engaged CTE to perform a Phase I ESA for the subject property on June 5, 2002. CTE produced the following Phase I ESA report:

- Report of Phase I Environmental Site Assessment, 519-555 West 76th Street, Chicago, Illinois, Prepared for City of Chicago, Department of Environment (DOE), prepared by Consoer Townsend Envirodyne Engineers, Inc., dated July 30, 2002.

Three copies of CTE's Report of Phase I ESA was submitted to SRP in early August 2002.

1.1.2 Identified RECs and AOECs

On-Site

Based on CTE's Phase I ESA findings and opinions, CTE identified the following on-site RECs and AOECs:

1. Historical Sanborn maps indicated one gasoline tank was used at the subject property between approximately 1924 and 1975. No evidence of spills or leaks from this tank were documented; however, use of tanks containing petroleum products are of considerable environmental concern because of the high likelihood of spills, overfills and/or leaks of petroleum products over time. CTE considered the former on-site gasoline tank to represent a material threat of a release of petroleum products, therefore, a REC.
2. The subject property has been historically used for industrial and warehousing purposes for more than 100 years. Historical Sanborn maps indicated site occupants conducted manufacturing of carriages and automobiles, storage of automobiles, and various light manufacturing and warehousing since prior to 1897. The historical Sanborn maps indicate numerous site operations and storage locations of potential environmental concerns due to their likely use of hazardous and/or petroleum-based chemicals and/or production of hazardous and/or petroleum-based waste.

Based on available and legible historical sources, the following specifically identified historical site operations and uses associated with carriage and automobile manufacturing between prior to 1897 and prior to 1941 were identified:



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- Three (3) coal storage areas
- One (1) coke storage area
- One (1) paint storage shed
- Five (5) buildings previously used for painting
- Several buildings used for erecting, trimming, machining, blacksmithing, wheel assembly, body work, motor assembly, machining, testing, rubbing, varnishing and wood dipping
- One (1) small incinerating room.
- Six (6) elevators were identified. It is unknown whether these elevators were electric powered or hydraulic. However, CTE contacted OTIS Elevator company, which did confirm that hydraulic elevators have been in use in the United States since about 1860. Based on CTE's experience, hydraulic elevators of this vintage often used polychlorinated biphenyl (PCB)-containing hydraulic oils.

Based on available historical city directories, a few of the many specifically identified historical site occupants/operations associated with various industrial and warehousing occupants of the subject property between about 1941 and 1993 included:

- Quigley Co. Firebrick
- Reliable Laundry Supplies Co.
- Amer Processing Co. Metals and Finishing
- Macco Products Co. Industrial Cleaners
- Lamar Metal Finishers
- Winsor Sheet Metal Works
- C & C Metal Finishing

Other site occupants identified in the historical city directories also might have used chemicals of concern, which could have been released to the subject property. Sanborn maps from 1951 through 1992 indicate a fireproofed building located just northeast of the boiler room that was apparently used for plating (assumed to be metals plating).

No direct evidence of historical releases of hazardous and/or petroleum-based chemicals and/or hazardous and/or petroleum-based waste was discovered during the Phase I ESA. However, due to the material threat of a release of hazardous and/or petroleum-based chemicals and/or hazardous and/or petroleum-based waste from historical on-site operations and uses, and because the exact locations of all the area's hazardous and/or petroleum-based chemicals and/or hazardous and/or petroleum-based waste were used or produced is not known, CTE considered the former subject property's industrial and warehouse use to be a REC.

Based upon the historical Sanborn maps, Figure 3 portrays a historical layout of on-site development. Figure 4, which supports Figure 3, summarizes historical on-site features and operations, as presented on the Sanborn maps.

3. Historical heating and steam generation for the subject property appears to have been centrally located in a boiler room for more than 100 years. Coal was apparently the most often used fuel. Emissions from coal combustion often contain residues with constituents of concern similar to petroleum products. These residues most likely settled on the subject property's surface and shallow subsurface. CTE considered this environmental concern to be a de minimis condition.
4. The location of former on-site electrical transformers, if any, is unknown, however, a room adjacent to the former boiler room was noted as a "vault", which might have been a transformer vault. Electrical transformers have historically used PCB-containing cooling oils. Therefore, CTE considered the probable former on-site use of PCB-containing cooling oils to be a REC.
5. Historically, various railroad spurs serviced the subject property. Their on-site configurations were significantly modified several times between 1897 and 1951. Railroad ties were often historically preserved with oily preservatives often including arsenic, creosote and other chemicals. There is a potential for these chemicals to have leached from the railroad ties onto the subject property. Also, pesticides and/or herbicides might have been used on railroad sidings to suppress vegetation growth or control vermin. Therefore, CTE considered the former on-site presence of railroad sidings to be a REC due to the material threat of a release of these chemical constituents to the subject property.
6. Equipment within the boiler room is noted on the Sanborn maps as being "Asbestos Covered". It was common for asbestos-containing material (ACM) to have been used within thermal insulating material and other building materials during the period the subject property was occupied. Asbestos is considered hazardous to human health. DOE permit and inspection records indicate previously observed ACM in abandoned buildings and on the property grounds and indicate some documentation of ACM planned for removal by demolition contractors. Standard procedure circa 1995 was for all ACM to be removed from buildings prior to their demolition.

Based on CTE's experience on other sites, some facilities using steam as a heating source have used steam transmission lines that were insulated with ACM and installed below ground surface in conduits or crawl spaces. These ACM-covered utilities were often left in place after building demolition and not discovered until years later during site development. CTE considered the potential former on-site use of steam transmission lines to be of potential environmental concern.

No evidence obtained during this Phase I ESA indicated any obvious or gross ACM remains on the subject property. However, the inclusion of asbestos as part of the Phase I ESA or the identification or sampling of suspect ACM was not within the scope of work of the Phase I ESA or Work Plan approved by DOE. CTE considered the former on-site use of ACM to be of potential environmental concern.

7. Documentation and information obtained from DOE permit and inspection records and an interview with a DOE inspector, which supported the initial incident reports obtained, indicated areas of environmental concern. The DOE inspector conducted a pre-demolition Site Assessment on July 18, 1995. The DOE inspector report indicates only four site buildings were present for inspection at that time. Specific environmental concerns included:
- The DOE inspector observed numerous drums of chemicals and acid within select buildings and an area of "unknown liquid spilled on ground". The exact area of spilled chemical was not noted by DOE. CTE considered these DOE observations to be RECs based upon their material threat of a release and documented release, respectively.
 - The DOE inspector observed an area of "USTs – apparently filled with sand", located to the south of a former building situated along W. 76th Street. No evidence of a release from these USTs was documented. However, CTE considered DOE's observation of USTs to be a REC based upon the material threat of a release.
 - Since no DOE Permit for UST Removal was available within DOE records, no permit for UST removal was apparently obtained. CTE considered the likelihood that the USTs are still present on the subject property to be a REC.
 - The potential environmental concern pertaining to on-site use of ACM, observations of suspect ACM on site-grounds and remediation of ACM, as discussed above, constitutes a REC.
 - Permit and inspection documentation obtained from DOE indicates incidences of illegal dumping. Information pertaining to the locations of on-site dumping and whether or when the dumped material was removed are not known. Information pertaining to the material dumped indicated construction debris was dumped. Since no other information obtained associated with these reports indicate environmental concern, CTE did not consider the incidences of illegal dumping to be environmental conditions.
 - Other DOE inspection record documentation indicates incidents of burning of demolition debris. The type of demolition debris being burned was not noted. However, it is common for polynuclear aromatic (PNA) constituents to be products of combustion of organic materials. Due to the potential for PNAs released to the subject property's surface and because the burning incident was subject to an



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enforcement action, CTE considered the former on-site burning of demolition debris to be a REC.

Off-Site

CTE's Phase I ESA of the subject property included an approximate 2-acre triangular shaped area adjacent to the south of the subject property situated south of 77th Street and north of 78th Street. At the time of the Phase I ESA, this area was thickly wooded. CTE noted within the Phase I ESA that a thorough visual assessment of this area was somewhat limited due to the density of the trees, overgrown brush and apparent piles of concrete and railroad ties.

Based on CTE's Phase I ESA findings and opinions, CTE identified the following off-site RECs and AOECs:

1. Observations by CTE representatives during site reconnaissance on June 12, 2002 and June 27, 2002 and DOE representatives during their site reconnaissance on June 14, 2002 indicated numerous rusted and empty abandoned 55-gallon drums in the wooded area adjacent to the subject property. It is unknown what chemicals were contained in the rusted empty drums. One 55-gallon steel drum, however, was closed and contained an unknown liquid. No drum labels were observed. CTE engaged the removal of the one drum of liquid from the subject property on June 27, 2002. Laboratory analysis confirmed the drum's contents to be flammable mineral spirits.

Since the drum of flammable mineral spirits was removed from the subject property and no evidence of a release from this drum was observed, CTE did not consider this drum to be a REC; however, did consider the drum to be a Historical REC.

CTE considered the presence of rusted and empty drums to be a REC due to the material threat of a past release in this area.

2. Available and legible historical sources (i.e., historical Sanborn maps) indicate the wooded area was occupied by the following historical uses:
 - a. One coal storage area
 - b. Several railroad sidings
 - c. One woodworking shed
 - d. One train depot and several unidentified small buildings
3. Observations within the wooded area indicated the presence of apparent piles of concrete, railroad ties and miscellaneous metal debris. The dense vegetation limited a thorough assessment of the characteristics of the debris in this area. Based upon our

observations and limited assessment of this area, CTE considered this area to be an AOEC.

DOE engaged CTE in October 2002 to conduct the removal of dense vegetation by "clearing and grubbing" the wooded area. Once the vegetation was cleared from this area, it was apparent that its elevation was consistently higher than the subject property and that numerous piles of concrete, railroad ties and miscellaneous metal debris had been dumped there over time. Further discussion of "clearing and grubbing" activities is presented in Section 3.0.

CTE oversaw the removal ("clearing and grubbing") of the vegetation from this approximate 2-acre adjacent parcel in October 2002. In November 2002, DOE encouraged the railroad companies to remove select vegetation and railroad ties from along the western edge of the Northern Parcel and the Southern Parcel. In December 2002, DOE engaged Tetra Tech EM, Inc., to segregate and remove select surface debris (i.e., tree stumps and vegetation, railroad ties, concrete, bricks, used tires, metal debris and asbestos) from the Southern Parcel.

1.2 SITE HISTORY

Based on the information presented in the Phase I ESA, a summary of the historical on-site uses include:

- The 1897 Sanborn map indicates one (1) subject property occupant: Staver and Abbott Manufacturing Company occupying approximately eleven (11) buildings/warehouses. Notations on the Sanborn map indicate that the building/warehouse uses included: storage/workshops, erecting, trimming, painting, machining, blacksmithing, wheel shop, planning, woodworking, body shop, harness shop and printing. A few areas of "lumber storage" were also noted. In addition, central to the main contiguous building situated on the western side of the subject property was a boiler room. Equipment within the boiler room is noted as being "Asbestos Covered" and having a brick chimney. Several rooms were situated adjacent to the boiler room, but their noted use is not legible. One room adjacent to the north of the boiler room is noted as a "vault", but its use as a transformer vault is unknown. A water tower appears to have been located east of the boiler room. Lights for the facility are noted as being "electric, gas and very little oil". Heat for the facility is noted as being "steam and stoves". Fuels for the facility are noted as being "coal and wood waste". However, a coke shed is noted on the southeastern portion of the subject property (Figure 3, Building 19). Coke is a fuel derived from destructive distilling of coal. A small room attached to the south of the Machine & Blacksmith Shop appears to be noted as "incinerating". Three elevators are noted within the main contiguous building.

The 1897 Sanborn map indicates the subject property was situated between two railroads: the Chicago & Western Illinois Railroad adjacent to the west of the subject property, running north to south, along Wallace Avenue; and, the C. R. I. & P. railroad adjacent to the eastern subject property boundary, running northeast to southwest, along Goldsmith Avenue (later Fielding Avenue, then Normal Avenue). These railroad easements intersected at 78th Street, south of the subject property. Both railroads appear to have been at street level in 1897 (not elevated). Three railroad sidings are shown to enter upon the subject property from the C. R. I. & P. Railroad.

- The 1910 map indicates one (1) subject property occupant: Staver Carriage Company (Makers of Carriages and Automobiles) occupying the same or similar on-site buildings. Some buildings appear to have been added or modified since 1897. One new building situated on the eastern side of the subject property is noted as being used for painting and upholstering. This building also included an elevator. Another new building located along W. 76th Street is noted as being used for "Repository on 2nd, Gear Painting on 3rd, Wheel As. on 4th & 5th". The 1910 Sanborn map appears to indicate other existing building uses to include Motor Assembly, Machine shop, Body Rubbing and Painting, Black Smith Shop, Bench Work, Resembling, Top and Seat Dept., Storage, Testing, Trim Shop, Rubbing & Varnishing and Wood Working. A separate Lumber building southeast of the boiler room is noted as having a "Dipping Room" and a "Bending Room". A coal storage area is noted adjacent to the west of the boiler room building. The map indicates the main contiguous building contained four elevators.

The 1910 Sanborn map also indicates a 100,000-gallon reservoir and a 30,000-gallon water tank (apparently-elevated) located on the east side of the subject property. The reservoir might have been used for steam generation with the boiler room and the water tank possibly for fire suppression.

New railroad sidings replaced some of the railroad sidings present in 1897.

- The 1924 map indicates one (1) subject property occupant: The Studebaker Corporation. The map indicates that all buildings were used for automobile storage. A gasoline tank is noted at the approximate center of the subject property. The size of the tank and whether it was above ground or below ground is unknown. The map also indicates that a kiln was located adjacent to the south of the boiler room. All other property buildings appear to be the same or similar location as shown on the 1910 Sanborn map, except for the Lumber (with Dipping Room & Bending Room) building, which was removed. The southern-most portion of the subject property is noted as having several lumber piles. The easternmost building present in 1910 is shown expanded to the north in 1924, and was used for storage and included one additional elevator. One building located just northeast



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of the boiler room is noted as being present in 1924, not sprinkled and of fireproof construction (Refer to Building 23 on Figure 3).

The adjacent Chicago & Western Illinois Railroad and C. R. I. & P. Railroad were elevated sometime between 1910 and 1924.

- Most Sanborn maps indicate subject property addresses to include 519, 525, 529, 539, 541 and 555 W. 76th Street. CTE obtained city directory research information for these addresses, which indicated no listings for most addresses. However, city directory research information for 525 W. 76th Street indicates Cook Industrial District and 14 apparent commercial, industrial and warehouse tenants in 1941. Years 1947, 1949, 1951, 1957, 1961, 1966, 1971, 1976, 1981, 1986, 1993 and 1999 were also included within the city directory research. Site occupants changed over these years, but site use appears to have remained commercial, industrial and warehouse. Based on the names of site occupants documented on the historical city directories, numerous past sites are of environmental concern to the subject property. However, the exact locations of these past site occupants (i.e., upon which portion of the subject property they operated) are not known. Based on available historical city directories, a few of the many specifically identified historical site occupants/operations associated with various industrial and warehousing occupants of the subject property between about 1941 and 1993 included:
 - Quigley Co. Firebrick
 - Reliable Laundry Supplies Co.
 - Amer Processing Co. Metals and Finishing
 - Macco Products Co. Industrial Cleaners
 - Lamar Metal Finishers
 - Winsor Sheet Metal Works
 - C & C Metal Finishing
- The 1951 and 1975 Sanborn maps for the subject property indicate site occupants included various tenants, specifically "Cook Industrial District - Various Manufacturing & Warehouses". The 1951 map indicates a gasoline tank present in the same location as indicated on the 1924 Sanborn map.

Sanborn maps from 1951 through 1992 apparently indicate the fireproof construction building located just northeast of the boiler room was used for plating. Steel storage is noted adjacent to and/or within this building in 1951.

The 1951 map indicates a small building located on the subject property's east side as "misc. storage". The 1975 map indicates the small building located on the subject property's east side as "paint storage".

- CTE reviewed historical aerial photographs dated 1949, 1952, 1963 and 1973. Buildings observable did not appear to be inconsistent with the building layouts shown on the Sanborn maps reviewed.
- The 1987, 1989 and 1992 Sanborn maps indicate subject property occupants as "76th St. Industrial District". Light Manufacturing Company remained as a tenant on the subject property. The subject property was referred to as "76th Street Industrial District- Various Manufacturing & Warehouses". Site uses appear to be the same or similar to those shown on the 1951 and 1975 Sanborn maps, except for a second boiler room situated to the south of the original boiler room on the 1987 Sanborn map. The small building located on the subject property's east side, noted as "paint storage" in 1975, is also noted as "paint storage" on the 1987, 1989 and 1992 Sanborn maps.
- CTE reviewed historical aerial photographs dated 1985, 1988, 1994 and 1995. Buildings observable did not appear to be inconsistent with the building layouts shown on the Sanborn maps reviewed.
- Based on inspection reports received from DOE, demolition of site buildings appears to have occurred in 1995.
- The subject property was vacant at the time of the site reconnaissances conducted in June and July 2002.

Based upon the historical Sanborn maps, Figure 3 portrays a layout of historical site use. Figure 4, which supports Figure 3, summarizes historical on-site site features and operations.

Adjacent Off-Site Uses

Based on the information presented in the Phase I ESA, historical uses of the adjacent off-site approximate 2-acre Southern Parcel includes:

- In 1897, the southern tip of this area appears to have been occupied by the "Auburn Station" railroad station. Several railroad sidings are shown to enter and exit from this area, which also served the subject property. Also, two railroad sidings are shown to enter the southeastern portion of the subject property from the Chicago & Western Illinois Railroad. A former "Woodruff & Kroy - Cooperage Stock Warehouse" (wood products) was also present and served by railroad sidings upon the adjacent Southern Parcel.
- The 1910 map indicates new railroad sidings replaced some of the railroad sidings present in 1897 and indicates the presence of a coal shed.

- CTE reviewed a 1949 historical aerial photograph. Several trees and railroad sidings were visible on the Southern Parcel.
- The 1951 and 1975 Sanborn maps indicate a few new railroad sidings, but no large coal shed or other large structures.
- CTE reviewed historical aerial photographs dated 1949, 1952, 1963, 1973, 1983, 1988, 1994 and 1995. Trees blocked the observation of the ground surface of the Southern Parcel.
- The Southern Parcel was wooded at the time of the site reconnaissance conducted in June and July 2002. The Southern Parcel's vegetation was "cleared and grubbed" in October 2002.

1.3 SITE DESCRIPTION

The subject property is located in the City of Chicago, Cook County, which is located in northeastern Illinois. Section 2.4 presents additional location information. The current owner of the subject property is the City of Chicago. Properties adjacent to the subject property are owned by the City of Chicago (e.g., city sidewalks and streets to the north and south), and occupied by railroad easements (i.e., owned by various railroad companies) to the west and east. Refer to the Site Base Map (Figure 2) and the Phase I ESA for other surrounding property information.

Information pertaining to the general physiography, geology and hydrogeology of the subject property is discussed in section 2.6 of the Phase I ESA. Based on the results of subsurface investigation, material found within the first approximately four feet below ground surface was found to be mostly fill. Evidence of fill material was also observed to depths of up to eight feet below ground surface in select soil probe borings. Below this depth, however, mostly brown sand was observed to 12 feet in most soil borings and, mostly brown and gray clay was observed below 12 feet below ground surface, as classified by CTE's field representative. The hydraulic conductivity of clay is typically between 1.0×10^{-10} centimeters per second (cm/sec) and 1.0×10^{-5} cm/sec.

Site assessment activities did identify the presence of groundwater on the subject property. Based on soil boring logs, the depth at which evidence of groundwater was observed within soil borings varied between four and 27 feet below ground surface. Potential on-site migration pathways include former building foundations, footings and utility conduits. Specific locations of these pathways are generally unknown.

Currently, the subject property is vacant. Post-remediation use of the subject property is planned to be residential development.

1.4 SITE BASE MAP

Figure 2 presents a Site Base Map which meets the requirements of Illinois Administrative Code (IAC) Title 35 Section 740.210 (a)(7). The location of the subject property may be referenced as any of the following:

- 519-555 West 76th Street, Chicago, Cook County, Illinois 60620.
- Property south of the intersection of West 76th Street and Parnell Avenue in Chicago, Illinois.
- United States Geological Survey (USGS), 7.5 minute quadrangle, Englewood, Illinois quadrangle, Township 38 North, Range 14 East, Section 28, SW quarter section.
- Approximately 41.754 degrees North Latitude and 87.638 degrees West Longitude.

Section 2.1.2 presents the identified RECs and AOECs. The site base map does not indicate specific on-site spill areas or known locations of COCs because of the scale of the map. The RECs and AOECs are thoroughly discussed in the text of the Phase I ESA and shown on the figures; some of the RECs and AOECs did not have specifically identified site-locations associated with them.

No known on-site or off-site injection or withdrawal wells are present. Former buildings on the subject property have been razed. Currently, no buildings, easements, pavement, tanks or active utilities are known to be present on the subject property, except for the "suspect USTs filled with sand", noted within DOE records. Refer to Section 4.2 for further discussion.



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1.5 LEGAL DESCRIPTION

DOE provided CTE with the Permanent Index Number (PIN) and a legal description for the subject property.

PIN 20-28-311-002 - owned by the City of Chicago in document 98625291.

NORTH PARCEL

ALL OF LOT 1, LOT 2 (EXCEPT THE WEST 10 FEET THEREOF), LOT 3 (EXCEPT THE WEST 10 FEET THEREOF) ALL OF LOT 4 AND THE NORTH 32.70 FEET OF LOT 5 IN BLOCK 9 IN HENDERSON'S SUBDIVISION OF THE SOUTH 120 ACRES OF THE EAST ½ OF THE WEST ½ OF SECTION 28, TOWNSHIP 38 NORTH RANGE 14 EAST OF THE THIRD PRINCIPAL MERIDIAN (EXCEPT THE NORTH 38.26 RODS OF THE WEST 38.26 RODS THEREOF AND EXCEPT RAILROAD LANDS), ALL IN COOK COUNTY, ILLINOIS. SAID PARCEL CONTAINS 208,763 SQUARE FEET (4.79 ACRES) MORE OR LESS

2.0 SITE SPECIFIC SAMPLING PLAN

CTE submitted a Work Plan for CSI to DOE dated May 24, 2002 in response to DOE's request for services (RFS) dated May 10, 2002. This work plan included a scope of work to perform a Phase I ESA and CSI. Following the completion of the Phase I ESA, CTE recommended the original invasive scope of work be modified to address the identified RECs and AOECs. The following subsections discuss the proposed scopes of work for invasive work at the subject property (North Parcel).

2.1 SUBSURFACE INVESTIGATION PLAN

In late June 2002, CTE prepared a sampling and analyses plan table (Sampling and Analysis Plan – Appendix A). The Sampling and Analyses Plan identified the soil boring designations from which soil and ground water samples would be collected by CTE's field representatives and which laboratory analyses would be selected for each sample. Appendix A also includes a figure which shows the planned locations of soil borings. Soil borings were planned to be advanced using a combination of auger and soil probe methods, due to the likelihood of old concrete foundations.

Also included in this section are the scope of work developed by CTE and DOE in September 2002, November 2002 and December 2002 to further assess the subject property, address SRP's October 15, 2002 letter comments and complete the CSI.

2.1.1 RECs and AOECs

Section 1.1.2 presents a summary of the RECs and AOECs identified during the Phase I ESA for which CTE recommended conducting an invasive environmental assessment. Figure 3 and Figure 4 support the Phase I ESA findings.

2.1.2 Contaminants of Concern

Based upon the findings of the Phase I ESA, the COCs for the subject property included:

- Volatile organic compounds (VOCs)
- Benzene, toluene, ethylbenzene and total xylenes (BTEX)
- Semi-Volatile organic compounds (Semi-VOCs)
- Creosote and pentachlorophenol
- Polynuclear aromatics (PNAs)
- Various metals
- Polychlorinated biphenyls (PCBs)



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- Pesticides and Herbicides
- Corrosivity (pH)

2.1.3 Non-Invasive Field Investigation

An electromagnetic (EM) survey was planned for two site areas with suspected historical underground storage tanks (USTs) and a third area thought to have a potential for buried steam lines.

- EM survey of approximately 5,000 square feet (suspect two USTs)
- EM survey of approximately 5,000 square feet (historical UST)
- EM survey of approximately 15,000 square feet (suspect buried steam lines)

Refer to Figure 3 for the areas of suspected and historical USTs.

2.1.4 Plan for Soil Sampling

In June 2002, CTE's Sample and Analyses Plan proposed to advance soil borings in approximately 50 locations on the subject property to assess for the presence or absence of COCs.

- Most borings were planned to be advanced to a depth of 12 feet below ground surface (bgs).
- Two soil borings were planned to be completed to a depth of 35 feet bgs.
- In most cases, two (2) soil samples per boring were planned to be collected for submittal to the laboratory for chemical analysis. Approximately 100 soil samples were proposed for laboratory analyses.
- CTE proposed that soil samples be collected continuously and screened with a photo-ionization detector (PID). Based on the field screening readings, visual and/or olfactory indicators of soil contamination, a choice was to be made in the field as to the location to collect the soil sample. Field conditions and observations could therefore modify the soil samples actually collected.
- CTE's field professional logged the subsurface stratigraphy encountered during advancement of the soil probe borings.
- Table 1 (Appendix A) presents the soil sampling strategy and chemical analyses for a given soil sample.
- The figure attached in Appendix A indicates the Proposed Soil Probe Boring Locations.
- Investigative derived waste was planned to be kept to a minimum. Soil cuttings and liquid were returned to sample location.
- CTE located each proposed sample location/boring through the use of a global positioning system (GPS) method.



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Analyses of soil samples were mainly limited and targeted to assess only those COCs identified for each REC and AOEC. A sample analyses strategy was also designed to satisfy many of the SRP analytical requirements, as indicated in 35 IAC Part 740's Appendix A.

The Sample and Analyses Plan (Appendix A) summarizes which soil samples were planned for submittal for which analyses. The plan for soil sample laboratory analyses included the following types of analyses:

- Volatile Organic Compounds (VOCs) by EPA method 8260B
- Semi-VOCs by EPA method 8270C
- Pesticides and Aroclors by EPA method 8081 and 8082
- Herbicides by EPA method 8321A
- Eight RCRA metals (total) by EPA methods 6000/7000
- Total cyanide by EPA method 9012
- Polynuclear aromatics (PNAs) by EPA method 8270C
- Total lead by EPA method 7421
- Total arsenic by EPA method 6020
- Corrosivity (pH) by EPA method 9045C

Assumptions/Notes

- Since the soil sampling strategy included the analysis for VOCs, CTE followed the recommended EPA method 5035 during the collection of these soil samples.
- Typical Field Methodologies for invasive scope of work are presented in Appendix B.

2.1.5 Plan for Groundwater Sampling

CTE proposed to collect groundwater samples from five (5) temporary groundwater monitoring wells, installed on the subject property, to assess select COCs within the subject property's shallow groundwater table.

- Grab groundwater samples were planned to be collected from temporary monitoring wells installed within five (5) soil borings.
- Three groundwater samples were collected from borings advanced to a depth of about 20 feet bgs.
- Two groundwater samples were collected from borings advanced to a depth of about 35 feet bgs.

The Sample and Analyses Plan (Appendix A) summarizes which groundwater samples were planned to be submitted for which analyses. The plan for groundwater sample laboratory analyses included the following types of analyses:

- Volatile Organic Compounds (VOCs) by EPA method 8260B
- Semi-VOCs by EPA method 8270C
- Pesticides and Aroclors by EPA method 8081 and 8082
- 8 RCRA metals (total) by EPA methods 6000/7000

2.1.6 Level of Quality Control Effort

The following quality control samples were planned for analyses:

- Two field duplicate samples to assess the quality of data generated by the field-sampling program. Field duplicates were analyzed to check sampling and analytical reproducibility.
- Two trip blank samples for shipment of samples to be analyzed for VOCs. Trip blank samples were used to evaluate potential VOC contamination during handling, shipping, and storage of aqueous samples.

2.1.7 Additional CSI - Post July 2002

In September 2002, CTE discussed the CSIR's findings with Mr. Steve McCaslin, Project Manager for the SRP and then proposed to conduct additional CSI via soil sampling activities in select locations for select COCs. The City of Chicago, Department of Transportation provided DOE with a backhoe for the purpose of conducting test pits. The scope of work for CSI included the following:

- Collect soil samples from the vicinity of Soil Boring No. 31 (SB31) for the purpose of vertical and horizontal delineation of VOCs (mainly Trichloroethylene).
- Collect up to two soil samples for analysis of 15 TAL metals, plus cyanide, from two select 'worse case' areas.
- Collect shallow soil samples in the vicinity of SB37, which exhibited an elevated concentration of PNA constituents (potentially above the soil's attenuation capacity), and analysis of these samples for Semi-VOC constituents.
- Collect shallow surface (between 0 and 6 inches bgs) soil samples in the vicinity of SB42 for analysis of total lead.

In October 2002, the SRP responded to CTE's July 31, 2002 CSIR with a letter dated October 15, 2002.



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In November 2002, CTE proposed to conduct additional CSI via soil sampling activities in select locations for select COCs. DOE indicated to CTE that it wished to proceed with further assessment of the Northern Parcel at that time. The scope of work for additional CSI included the following:

The soil investigation plan included:

- Advancement of up to sixteen (16) shallow soil borings
- Collection of up to 2 soil samples for SVOC analysis in the vicinity of SB-37
- Analysis of up to 16 soil samples for total lead and leachable lead by TCLP
- Collection of 1 soil sample for reactive cyanide and reactive sulfide analysis from the subject property
- Collection of 2 soil samples for Particle Size Distribution analysis from the subject property
- Collection of 2 soil samples for Fractional Organic Carbon (FOC) analysis from the subject property
- Collection of 2 soil samples for Bulk density and Particle density analysis from the subject property

The groundwater investigation plan included:

- Installation of three (3) Type II groundwater-monitoring wells on the "North Parcel" (subject property)
- Survey the monitoring wells' elevations
- Development and measurement of the groundwater table
- Development of and evaluation of a potentiometric surface map
- Performance of slug tests
- No groundwater samples were to be collected for analyses
- Well development water was to be pumped to the ground surface for infiltration and evaporation
- Abandonment of the wells at a future date, undetermined at this time

In December 2002, CTE proposed to conduct additional CSI via soil sampling activities in select locations for lead. The scope of work for additional CSI included the following:

- One field day of field activities to accomplish the advancement of up to thirty five (35) shallow soil borings.
- Collection of up to 3 shallow soil samples per boring from the following 3 discrete intervals: 0-18"; 18-36"; 36-48".
- Analysis of up to 105 soil samples for total lead
- Analysis of up to 105 soil samples for leachable lead by TCLP



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- Analysis of up to 6 soil samples for leachable lead by SPLP
- The analysis strategy followed a series of analysis steps, beginning by analysis of select samples for total lead, then subsequent analysis of a variety of total lead, TCLP lead and SPLP lead, depending upon the previous results.

Results of additional CSI targeted for total lead and leachable lead delineation will be summarized in a separate report and submitted to SRP under separate cover.

3.0 SUMMARY OF SUBSURFACE INVESTIGATION ACTIVITIES

CTE conducted several invasive assessment events at the subject property. Initial field activities for these sampling events were conducted on June 27, July 2 and July 3, 2002. Subsequent field investigation activities were conducted on September 24, November 21, November 27 and December 6, 2002.

The following subsections discuss the scope of work conducted and the findings of subsurface investigation activities.

3.1 SUBSURFACE INVESTIGATION ACTIVITIES

3.1.1 Deviations from the Proposed Scope of Work

No significant deviations from the proposed scope of work occurred. However, the following four minor modifications were made due to field observations/conditions/variances:

- Proposed soil boring SB43 was not completed.
- Planned groundwater analyses, as shown on the Sampling and Analyses Plan (Appendix A), included VOCs, SVOCs, 8 RCRA metals, Pesticides and PCBs. Due to CTE's error during collection and on the chain-of-custody, the groundwater samples were analyzed for VOCs, PNAs, 8 RCRA metals and Pesticides, only.
- DOE authorized leachable lead analysis Toxicity Characteristic Leachate Procedure (TCLP) for two soil samples, SB42A and SB53. SB53 was collected from the Southern Parcel (i.e., off-site).
- CTE engaged the removal of one 55-gallon drum of flammable mineral spirits from the wooded area of the subject property (i.e., off-site - Southern Parcel).

3.1.2 Scope of Work Conducted – June and July 2002

CTE conducted subsurface investigation activities on June 27, July 2 and July 3, 2002. Mid-America Drilling Services, Inc., of Elburn, Illinois, under contract to CTE, conducted soil boring, soil probe and hand auger advancement (referred to as soil borings). CTE field personnel identified the locations to be sampled, conducted soil sampling, visually classified the soil samples, field screened the soil samples using a PID, and transported the samples to the laboratory with chain of custody documentation.

Following the Sampling and Analyses Plan (Appendix A), soil borings SB1 through SB48 (except SB43) were advanced on the subject property. Refer to Figure 5 for these soil boring locations. The soil probe borings were advanced to depths ranging from three to 35 feet bgs.

Continuous soil cores were collected from the soil probe borings and were field screened, typically once every two-foot or four-foot interval. Elevated volatile organic vapors (PID readings) were detected in some soil samples.

Temporary monitoring wells/piezometers were installed in soil borings SB1, SB24, SB21, SB45 and SB30. Groundwater samples were collected from the temporary monitoring wells/piezometers using a peristaltic pump and clean flexible plastic tubing. Groundwater samples were designated GW-1, GW-2, GW-3, GW-4 and GW-5, respectively.

3.1.3 Scope of Work Conducted – September 24, 2002

CTE conducted subsurface investigation activities on September 24, 2002 via test pits utilizing a backhoe. CTE field personnel identified the locations to be sampled, conducted soil sampling, visually classified the soil samples, field screened the soil samples using a PID, and transported the samples to the laboratory with chain of custody documentation.

- Four test pits were advanced in a 40-foot radius from SB31A (i.e., TP31-N, TP31-W, TP31-S and TP31-E). Three soil samples were collected from each test pit at discrete vertical depths up to 17 feet bgs. Thus, 12 soil samples were submitted for analysis of VOCs for the purpose of horizontal and vertical delineation of VOCs in the vicinity of SB31A and SB31-B.
- Three shallow test pits were advanced to depths up to three feet bgs in the immediate vicinity of SB37. One discrete soil sample was collected and submitted for analysis of SVOCs for the purpose of horizontal delineation of SVOCs. Concrete foundations in this area prevented excavations at deeper depths.
- One test pit was excavated in the area of SB42 (TP42-A) and one test pit was excavated in the area of SB20 (TP20-A). One discrete soil sample was collected from each test pit and submitted for analysis of 15 TAL metals (total), plus total lead and total cyanide.
- Eight additional shallow soil samples (TP42-B, TP42-C, TP42-D, TP42-E, TP42-F, TP42-G, TP42-H, TP42-I) were collected in the vicinity of SB42 (i.e., adjacent to the east, south and west of the foundation of former Building 20) at a depth of 0-6" and submitted for analysis of total lead.

Figure 5 indicates the locations of the test pits. The test pits were excavated to depths ranging from three to 20 feet bgs in those areas designated in the sampling plan. Soil samples were collected from the test pits and were field screened, typically once every two-foot or four-foot interval.

3.1.4 Scope of Work Conducted – November 21, 2002

Field investigation activities conducted on November 21, 2002 included the following:

- Three groundwater monitoring wells were installed. MW1 was installed in the northwest area of the subject property to a depth of 8.3 feet bgs with a flush-mounted protective cover. MW2 was installed in the northeast area of the subject property to a depth of 10.4 feet bgs with a flush-mounted protective cover. MW3 was installed in the southeast area of the subject property to a depth of 9.0 feet bgs with a flush-mounted protective cover.
- Two composite soil samples were collected for laboratory analyses of Particle Size Distribution, Fractional Organic Carbon, Bulk density and Particle density. Soil sample MW-A represented a composite of soil from the 18"-36" depth interval from each MW1, MW2 and MW3 soil boring. Soil sample MW-B represented a composite of soil from the 4'-6' depth interval from each MW1, MW2 and MW3 soil boring.
- Soil borings SB37-A and SB37-B were advanced in the vicinity of former soil boring SB37.
 - Two composite soil samples were collected for SVOC analysis: SB37-A/B (1'-3') and SB37-A/B (4'-6').
 - A composite soil sample was collected for laboratory analyses of Reactive Cyanide and Reactive Sulfide analyses: soil sample SB37-A/B (1'-3').
- Soil sample SB42/20 (1'-3') was collected as a composite of two soil samples collected from the vicinity of former soil borings SB42 and SB20 at a depth interval of 1-3 feet bgs.
 - Soil sample SB42/20 (1'-3') was analyzed for Reactive Cyanide and Reactive Sulfide analyses.

3.1.5 Scope of Work Conducted – November 27, 2002

Fourteen shallow soil borings were advanced in the vicinity north of former Building No. 9. Fourteen soil samples were collected from the depth interval 0-18" bgs and submitted for laboratory analyses of total lead. Sample designations included SB42-J through SB42-W.

3.1.6 Scope of Work Conducted – December 6, 2002

Forty-five shallow soil borings were advanced in the vicinity north and east of former Building No. 9 and Building No. 20. Three soil samples were collected from each soil boring, at depth intervals of 0-18", 18-36" and 36-48" bgs. The laboratory analyses strategy included analysis of



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total lead and/or leachable lead by TCLP. Sample designations included SB42-X through SB42-BJ.

3.2 FINDINGS OF SUBSURFACE INVESTIGATION

3.2.1 Electromagnetic Survey – July 2002

Three select areas of the subject property were surveyed with the electromagnetic survey equipment by CTE's contractor, D.F. Stazy, Inc. The three areas targeted included:

- EM Survey Area A: Suspect "Two USTs filled with Sand" (Figure 3 – Area 31). Approximately 5,000 square feet were surveyed.
- EM Survey Area B: Historical gasoline UST (Figure 3 – Area 30). Approximately 5,000 square feet were surveyed.
- EM Survey Area C: Suspect buried steam lines along east side of Areas 5, 6, 7 and 8 as designated on Figure 3. Approximately 15,000 square feet were surveyed.

The findings indicate the following results:

- EM Survey Area A: One large metallic anomaly (suspect UST) detected.
- EM Survey Area B: Several small metallic debris anomalies. No significant metallic anomalies detected.
- EM Survey Area C: No significant metallic anomalies detected.

Appendix C presents the EM Survey report.

Further UST Investigation – On September 23, 2002, CTE oversaw test pit excavations conducted at and in the vicinity of EM Survey Area A. The City provided a backhoe and CTE provided a metal detector to conduct the effort. No evidence of USTs was uncovered.

3.2.2 Soil – July 2002

Fill consisting of sand, gravel, wood, concrete and brick fragments was encountered within the subsurface between ground surface and up to 5 feet bgs in some soil borings, but not all soil borings. The majority of the soil encountered to a depth of about 12 feet bgs was brown sand. Soil encountered below the sand was mainly gray clay. Following the completion of soil probe activities, each soil probe location was plugged with soil cuttings and/or bentonite chips. Refer to Appendix D for the Logs of Soil Probes, which indicated the subsurface material encountered during each soil probe and the field screening results of each soil sample interval.

Results of laboratory analyses were compared to the corrective action objectives within the 35 Illinois Administrative Code Part 742, TACO - Appendix B, Table B (and others), dated August 15, 2001, and evaluated for residential property use. The following is a brief summary of the findings of subsurface investigation:

- Twenty-six (26) soil samples were analyzed for corrosivity (pH). Laboratory analyses indicated a measured range of 7.21 standard units to 11.05 standard units.
- Fourteen (14) soil samples were analyzed for PCBs. No PCBs were detected in any soil sample.
- Fourteen (14) soil samples were analyzed for pesticides. No pesticides were detected in any soil sample.
- Nine (9) soil samples were analyzed for herbicides. No herbicides were detected in any soil sample.
- 56 soil samples were analyzed for 8 RCRA metals, 6 soil samples were analyzed for total arsenic, 4 soil samples were analyzed for total lead and, 4 soil samples were analyzed for total cyanide. No total cyanide was detected. Laboratory analyses indicated five (5) soil samples with elevated total lead (i.e., above 400 mg/kg) and one (1) soil sample with elevated total arsenic (i.e., above 13.0 mg/kg). The most elevated concentrations were 3,300 mg/kg and 18.5 mg/kg, respectively.
- One (1) soil sample (SB42A) was analyzed for leachable lead by the Toxicity Characteristic Leachate Procedure (TCLP). Laboratory analytical results indicate concentrations of leachable lead of 1.68 mg/L for soil sample SB42A, which exceeded the Soil Component of the Groundwater Ingestion Exposure Route (SCGIR) remediation objective for Class I groundwater of 0.0075 mg/L and the SCGIR remediation objective for Class II groundwater of 0.1 mg/L. The toxicity limit for TCLP lead is 5.0 mg/L, above which it is considered characteristically hazardous.
- Sixty-four (64) soil samples were analyzed for VOCs. Five VOC COCs within five soil samples exceeded the TACO Tier 1 remediation objectives for the Ingestion, Inhalation, SCGIR (Class I), SCGIR (Class II) and/or Construction Worker exposure routes. Refer to Section 5.1 and Section 5.3 for further details.
- 92 soil samples were analyzed for PNAs or SVOCs. Five PNA/SVOC COCs within about 50 soil samples exceeded the TACO Tier 1 remediation objectives for the Ingestion, Inhalation, SCGIR (Class I), SCGIR (Class II) and/or Construction Worker exposure routes. Refer to Section 5.1 and Section 5.3 for further details.

Table 1, Table 2 and Table 3 summarize soil sample analytical data and compare the results with TACO Tier 1 remediation objectives. Appendix E presents the laboratory analytical data sheets and chain of custody documentation for soil samples.

Additional notes that pertain to the soil investigation include:

- The scope of work was conducted in general accordance with the IEPA Title 35 Part 740.420 (Comprehensive Site Investigation).
- Laboratory procedures and methods met the minimum specified detection limits in accordance with the IEPA TACO Title 35 Part 742 and/or SW 846 protocols, including the residential standards.
- Laboratory results were compared to TACO corrective action objectives for residential land use and construction worker scenarios.
- Since the soil sampling strategy included the analysis for volatile organics, CTE followed the recommended EPA method 5035 during the collection of these soil samples.

The subsurface investigation conducted for this CSI included the collection of ninety-three (93) soil samples submitted for select and multiple chemical analyses. The following chemical analyses were performed for soil samples:

- 64 samples: Volatile Organic Compounds (VOCs) by EPA method 8260B
- 74 samples: Polynuclear aromatics (PNAs) by EPA method 8270C
- 19 samples: Semi-VOCs by EPA method 8270C
- 20 samples: Pesticides by EPA method 8081
- 14 samples: Polychlorinated biphenyls (PCBs) by EPA method 8082
- 15 samples: Herbicides by EPA method 8321A
- 56 samples: Eight RCRA metals (total) by EPA methods 6000/7000
- 13 samples: Total arsenic by EPA method 6020
- 04 samples: Total lead by EPA method 7421
- 04 samples: Total cyanide by EPA method 9012
- 26 samples: Corrosivity (pH) by EPA method 9045C

Table 1 presents a summary of detected COCs for soil samples and the concentrations at which the COCs were detected.

Table 2 provides a summary of:

- The quantity of soil samples analyzed for each analyses type.
- COCs with concentrations above Tier 1 TACO residential remediation objectives for the exposure routes – Ingestion, Inhalation, SCGIR (Class I), SCGIR (Class II) and Construction Worker.
- The ranges of concentrations detected for those COCs present.

Table 3 presents a summary of only those COCs with concentrations above Tier 1 TACO residential remediation objectives for the exposure routes – Ingestion, Inhalation, SCGIR (Class I), SCGIR (Class I) and Construction Worker.

3.2.3 Groundwater – July 2002

Five (5) groundwater samples were collected from the subject property for select chemical analyses of VOCs, PNAs, 8 RCRA metals and Pesticides. One groundwater sample detected one VOC (1,2-Dichloroethane) at a concentration above its TACO Tier 1 remediation objective for Class I groundwater. No other VOCs, metals, PNAs or Pesticides were detected above TACO Tier 1 remediation objective for Class I groundwater.

Table 4 summarizes groundwater sample analytical data and compares the results with TACO Tier 1 remediation objectives. Appendix F presents the laboratory analytical data sheets and chain of custody documentation for groundwater samples.

The subsurface investigation conducted for this CSI included the collection of five (5) groundwater samples submitted for select and multiple chemical analyses. The following chemical analyses were performed for groundwater samples:

- 5 samples: Volatile Organic Compounds (VOCs) by EPA method 8260B
- 5 samples: Polynuclear aromatics (PNAs) by EPA method 8270C
- 5 samples: Pesticides by EPA method 8081
- 5 samples: Eight RCRA metals (total) by EPA methods 6000/7000

Table 4 presents a summary of detected COCs in groundwater samples and indicates which COCs exceeded TACO Tier 1 remediation objectives.

3.2.4 Soil – September 24, 2002

Results of laboratory analyses of soil samples collected on September 24, 2002 are summarized below.

- Select VOCs were detected in all samples targeted for VOC analysis. Three soil samples exhibited concentrations of VOCs above remediation objectives and each of these three were collected from depths below 8 feet bgs. In addition, five COCs within five soil samples exceeded their respective TACO Tier 1 remediation objectives for the SCGIR (Class I) and/or SCGIR (Class II) exposure routes. Refer to Table 5 for a summary of laboratory analytical results.

- SVOCs were detected in the three soil samples targeted for SVOC analysis. Five COCs within these three soil samples exceeded their respective TACO Tier 1 remediation objectives for the Ingestion, Inhalation, SCGIR (Class I) and/or SCGIR (Class II) exposure routes. However, none exceeded the attenuation capacity. Refer to Table 5 for a summary of laboratory analytical results.
- Total cyanide was detected within all three soil samples targeted for total cyanide, however, none were above its TACO Tier 1 remediation objectives. Refer to Table 6 for a summary of laboratory analytical results.
- Total lead exceeded its TACO Tier 1 remediation objective for the Ingestion exposure route for all soil samples targeted for total lead. Total lead concentrations ranged from 520 mg/kg to 3,900 mg/kg. Leachable lead analysis was performed on four soil samples, which yielded one soil sample, TP42-D, at a concentration of 98 mg/L. DOE requested the laboratory re-analyze this soil sample for leachable lead by TCLP, which yielded a result of 9.6 mg/L. Refer to Table 6 for a summary of laboratory analytical results.

Appendix G presents the laboratory analytical data sheets and chain of custody documentation for soil samples collected on September 24, 2002.

3.2.5 Soil – November 21, 2002

Results of laboratory analyses of soil samples collected on November 21, 2002 are summarized below.

- No SVOCs exceeded their TACO remediation objective for soil samples SB37-A/B (1'-3') and SB37-A/B (4'-6'). Refer to Table 5 for a summary of laboratory analytical results.
- Results of Reactive Cyanide and Reactive Sulfide analyses indicated 'not detected' (ND) for both soil samples SB37-A/B (1'-3') and SB42/20 (1'-3').
- Particle Size Distribution analysis indicated sample MW-A (18"-36") was primarily brown sand and MW-B (4'-6") was primarily brown sand.
- Fractional Organic Carbon analysis of soil samples indicated results of 1.19% and 1.36% for soil samples MW-A (18"-36") and MW-B (4'-6"), respectively.
- Soil particle density (Specific Gravity) analysis indicated results of 2.67 and 2.71 for soil samples MW-A (18"-36") and MW-B (4'-6"), respectively. Soil bulk density can be calculated using equation S24.

Appendix G presents the laboratory analytical data sheets and chain of custody documentation for soil samples collected on November 21, 2002.

3.2.6 Soil – November 27, 2002

As stated in section 3.1.5, 14 shallow soil borings were advanced in the vicinity north of former Building No. 9. Fourteen soil samples were collected from the depth interval 0-18" bgs and submitted for laboratory analyses of total lead. Sample designations included SB42-J through SB42-W.

Results of additional CSI targeted for total lead and leachable lead delineation will be summarized in a separate report and submitted to SRP under separate cover.

3.2.7 Soil – December 6, 2002

As stated in section 3.1.6, 45 shallow soil borings were advanced in the vicinity north and east of former Building No. 9 and Building No. 20. Three soil samples were collected from each soil boring, at depth intervals 0-18", 18-36" and 36-48" bgs. The laboratory analyses strategy included potential analysis of total lead and/or leachable lead by TCLP. Sample designations included SB42-X through SB42-BJ.

Results of additional CSI targeted for total lead and leachable lead delineation will be summarized in a separate report and submitted to SRP under separate cover.

3.3 GROUNDWATER DEPTH, FLOW DIRECTION AND RATE

Groundwater monitoring wells MW1, MW2 and MW3 were installed on the subject property on November 21, 2002. Groundwater monitoring well construction diagrams are presented in Appendix H.

Depths to static groundwater were measured on November 27, 2002. The Table 3-1 below indicates groundwater depth information.

| TABLE 3-1 | | | |
|---------------------|--------------|----------------------------------|--------------|
| Monitoring Well No. | Total Depth* | Depth to Water* on Nov. 21, 2002 | Elevation ** |
| MW1 | 8.17 | 6.09 | 97.29 |
| MW2 | 10.79 | 7.71 | 99.29 |
| MW3 | 8.98 | 6.92 | 98.46 |



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Table 3-1 Notes:

- * Feet below top of casing elevation
- ** Site elevation upon local fire hydrant assumed to be 100.00 feet. Elevations reflect top-of-casing, measured on November 27, 2002.

Figure 6 shows potentiometric surface contours and interpreted direction of groundwater flow for the November 27, 2002 data. Relative elevations indicate direction of groundwater flow to be toward the south-southwest.

The ROR will include the results of CTE's slug testing and calculations of hydraulic conductivity, hydraulic gradient and groundwater flow rate.

4.0 ENDANGERMENT ASSESSMENT

4.1 EVALUATION OF RECs, EXPOSURE ROUTES AND THREATENED RELEASES

4.1.1 Evaluation of RECs

RECs, AOECs and COCs identified in the Phase I ESA were discussed in Section 1.1.2 and Section 2.1.2 of this report. CTE's results and findings associated with subsurface investigation activities conducted are thoroughly discussed in Sections 3.0 and 4.0.

COCs detected within subject property soil above TACO Tier 1 remediation objectives for residential properties (summarized on Table 3) include:

- Select VOCs: cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride
- Total arsenic and total lead
- Leachable lead by the Toxicity Characteristic Leachate Procedure (TCLP) procedure
- Select PNAs/SVOCs: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; carbazole; chrysene; dibenzo(a,h)anthracene; indeno(1,2,3-cd)pyrene, and; naphthalene

One groundwater sample detected the following COC above its TACO Tier 1 remediation objective for Class I groundwater (summarized on Table 4):

- One VOC: 1,2-Dichloroethane

4.1.2 Evaluation of Exposure Routes

Currently, the subject property is vacant with some old concrete foundations and slabs at and below grade, but mostly its surface is soil-covered. The planned re-development of the subject property includes residential dwellings and outdoor walking/park/play areas.

Exposure routes may be identified as those specified in TACO including Ingestion, Inhalation, Soil Component of the Groundwater Ingestion Exposure Route (SCGIR) and Groundwater Ingestion.

Ingestion Exposure Route (Residential) - Based on the laboratory analytical results and CTE's findings, the COCs (metals and PNAs/SVOCs) summarized in Section 4.1.1 above were detected above the Tier 1 remediation objectives for residential properties for the Ingestion



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exposure route. The Remediation Objectives Report (ROR), which will be submitted under separate cover, will further discuss and address the exclusion of this exposure route.

Ingestion Exposure Route (Construction Worker) - Based on the laboratory analytical results and CTE's findings, the select COCs (lead and select PNAs), were detected above the Tier 1 remediation objectives for the Construction Worker Ingestion exposure route. The ROR, which will be submitted under separate cover, will further discuss and address this exposure route.

Inhalation Exposure Route (Residential) - Trichloroethene was detected within five soil samples at concentrations that exceeded their Tier 1 remediation objectives for residential properties under Subpart E for the inhalation exposure route (refer to Table 3 and Table 5). Vinyl chloride was detected within two soil samples [TP31-S (12'-14') and TP31-W (14'-15')] at concentrations that exceeded their Tier 1 remediation objectives for residential properties under Subpart E for the inhalation exposure route. The ROR, which will be submitted under separate cover, will further discuss and address the exclusion of this exposure route.

Inhalation Exposure Route (Construction Worker) - Naphthalene was detected within three soil samples at a concentration that exceeded its Tier 1 remediation objective for the Construction Worker scenario inhalation exposure route. The ROR, which will be submitted under separate cover, will further discuss and address the exclusion of this exposure route.

Soil Component of the Groundwater Exposure Route - TCLP lead analysis was performed on two soil samples (SB-42A and SB-53) that exhibited the most elevated total lead result. Concentrations of TCLP lead detected were 1.68 mg/L and 7.24 mg/L, respectively, which did exceed the Tier 1 remediation objectives for residential properties for the SCGIR for Class I groundwater (0.0075 mg/L) and Class II groundwater (0.1 mg/L).

In general, based on the drinking water ordinance, the Soil Component to the Groundwater Ingestion exposure route and the Groundwater Ingestion exposure route may be excluded from consideration. The ROR, which will be submitted under separate cover, will further discuss and address the exclusion of this exposure route.

Groundwater Ingestion Exposure Route - Due to a City of Chicago ordinance, which prohibits the use of groundwater within the City of Chicago as a potable source of water, all residents of the subject property, the surrounding area and the City of Chicago are supplied drinking water from the City of Chicago. The City of Chicago obtains its water from Lake Michigan. The IEPA has an agreement with the City of Chicago and recognizes the drinking water ordinance as an institutional control. The ROR, which will be submitted under separate cover, will further discuss and address the exclusion of this exposure route.

4.1.3 TACO Section 742.300

Soil

Based on the findings of CTE's subsurface assessment activities and results of laboratory analyses as presented in this CSIR, the characterization of COCs within the soil on the subject property is completed. However, the following is worthy of further assessment:

- In select locations, delineation of the extent and concentrations of total and/or leachable lead within shallow soil

Groundwater

Although one groundwater sample indicated a concentration of 1,2-Dichloroethane above the remediation objective for Class I groundwater, but lower than the remediation objective for Class II groundwater, CTE believes the characterization of the extent and concentrations of COCs within groundwater on the subject property has been completed.

4.1.4 TACO Section 742.305

CTE conducted a contaminant source and free product determination for the subject property:

- The sum of the concentrations of all organic COCs has not exceeded the attenuation capacity of the soil as determined under TACO Section 742.215.
- The concentrations of all organic COCs remaining in the soil do not exceed the soil saturation limit as determined under TACO Section 742.220.
- Four soil samples were analyzed for reactive cyanide and reactive sulfide. The results from these tests did not indicate that the soil had reactive characteristics. In addition, COCs which are unstable or explosive in nature were not identified in association with the subject property's historical use.
- Twenty-six (26) soil samples collected from the subject property were analyzed for corrosivity (pH) by EPA method 9405C. The results indicated that pH on the subject property to be in the range of 7.21 standard units to 11.05 standard units.
- Based on CTE's review of soil sample laboratory analytical data for total TAL metal and TCLP lead, the results indicate leachable metals are not of concern for all metals except for lead. Therefore, TCLP analyses for arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium and silver were not performed. Refer to Table 3 and Table 6 for the results of TCLP lead analysis.

4.1.5 Water Well Search

CTE solicited and obtained water well information from the Illinois State Water Survey (ISWS) and the Illinois State Geological Survey (ISGS). Information provided indicated no registered water wells on the subject property. No known on-site injection or withdrawal wells are present.

Information provided to CTE by the ISWS did identify one historical well associated with the subject property. The Illinois State Water Survey form indicated this well was not used since 1922 and was "sealed and capped".

Information obtained and reviewed by CTE did not indicate additional wells or historical wells within a 1,000-foot radius of the subject property. Appendix I presents the results of CTE's well search and copies of well forms for wells identified within a 2,500-foot radius from the subject property.

On November 27, 2002, CTE performed a windshield well survey via automobile within an approximate 2,500 foot radius of the subject property. The surrounding neighborhoods are mostly residential. No evidence of existing water wells was observed.

4.1.6 Threatened Releases

No direct evidence of potential threatened releases was observed on the subject property.

4.2 DE MINIMIS CONDITIONS

De minimis conditions are conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.

No de minimis conditions were identified on the subject property, except for those presented within CTE's Phase I ESA and summarized in Section 1.1.2.

4.3 NATURE, EXTENT AND CONCENTRATIONS OF COCs

4.3.1 Soil

More than 100 soil samples were collected from the subject property for select and multiple chemical analyses. The nature of COCs detected within subject property soil above TACO Tier 1 corrective action objectives for residential properties include:

- Select VOCs: cis-1,2-Dichloroethene; trans-1,2-Dichloroethene; tetrachloroethene; trichloroethene; vinyl chloride
- Total arsenic and total lead
- Leachable lead by the Toxicity Characteristic Leachate Procedure (TCLP) procedure
- Select PNAs/SVOCs: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k)fluoranthene; carbazole; chrysene; dibenzo(a,h)anthracene; indeno(1,2,3-cd)pyrene, and; naphthalene

Extent of VOCs in Soil

Each of the above VOCs is a manmade, solvent-type chemical. Except for vinyl chloride, each of these VOCs has a relative density (specific gravity) greater than 1.0 (water = 1.0), therefore, is heavier than water. Vinyl chloride has a specific gravity of 0.9 and is most often a daughter-product of the other VOCs detected. The above VOCs were detected in soil samples (from soil borings SB21, SB31 and SB39 and test pits TP31-W and TP31-S) collected from areas of the subject property with historical uses which are thought to have included the use of solvent-type chemicals. No VOCs were detected in the groundwater samples collected from the vicinity of these soil samples (i.e., SB-21/GW-3, SB-45/GW-4).

Soil observed within the vicinity of these soil borings and generally throughout the site indicates the general stratigraphy of the subject property's subsurface to include sand to about 12 feet bgs, gray clay below 12 feet bgs and gray clay to a depth of at least 35 feet bgs. Gray clay often has a hydraulic conductivity between 1.0×10^{-10} cm/sec and 1.0×10^{-5} cm/sec. Therefore, although the specific gravities of these VOCs are mostly greater than 1.0, the presence of gray clay suggests a relatively impermeable barrier to downward mobility of COCs, and suggests that elevated concentrations of VOCs would be limited to the sand layer and groundwater table area at and above 12 feet bgs.

Extent of Arsenic in Soil

One (1) soil samples within the 0-3 foot interval bgs exhibited a total arsenic concentration above the residential Ingestion remediation objective of 13.0 mg/kg. Soil samples collected from depths deeper than 3 feet bgs did not exhibit elevated concentrations of total arsenic. Therefore, the vertical extent of total arsenic on the subject property appears to have been delineated.

Extent of Lead in Soil

Table 3 and Table 6 indicate several soil samples collected from the shallow depth interval do exhibit a total lead concentration above the residential Ingestion remediation objective of 400

mg/kg. The locations at which the soil samples with elevated total lead were collected varied on the subject property and did not indicate any pattern of impacts. Soil samples collected from depths deeper than 3 feet bgs did not exhibit elevated concentrations of total lead. Therefore, the vertical extent of total lead appears to have been delineated.

Table 3 and Table 6 indicate several soil samples collected from the shallow depth interval do exhibit leachable lead concentrations that exceed the Tier 1 remediation objectives for residential properties for the SCGIR for Class I groundwater (0.0075 mg/L) and Class II groundwater (0.1 mg/L). Select soil samples also exceeded the toxicity limit for TCLP lead of 5.0 mg/L.

Extent of PNAs/SVOCs in Soil

The horizontal extent of PNAs/SVOCs is estimated to be throughout most of the subject property's shallow subsurface (i.e., most of the elevated PNAs/SVOCs were detected within soil samples collected from the 0-3 foot interval bgs). PNAs/SVOCs detected in soil samples collected from depth intervals below 3 feet bgs were significantly lower in concentration or not detected. Therefore, the vertical extent of PNAs/SVOCs on the subject property appears to have been significantly delineated.

Concentrations of COCs in Soil

Table 1 presents a summary of detected COCs for soil samples collected in June and July 2002 and the concentrations at which the COCs were detected.

Table 2 provides a summary of the ranges of concentrations detected for those COCs presented for soil samples collected in June and July 2002.

Table 3 presents a summary of only those COCs with concentrations above Tier 1 TACO residential remediation objectives for the exposure routes – Ingestion, Inhalation, SCGIR (Class I), SCGIR (Class I) and Construction Worker for soil samples collected in June and July 2002.

Table 5 presents a summary of detected organic COCs for soil samples collected in September and November 2002 and the concentrations at which the COCs were detected.

Table 6 presents a summary of detected inorganic COCs for soil samples collected in September 2002 and the concentrations at which the COCs were detected.

4.3.2 Groundwater

Five (5) groundwater samples were collected from the subject property for select chemical analyses. One groundwater sample detected the COC shown below at a concentration above its TACO Tier 1 remediation objective for Class I groundwater (summarized on Table 4):

- One VOC: 1,2-Dichloroethane

1,2-Dichloroethane is a manufactured chemical that is not found naturally in the environment. It is clear and has a pleasant smell and a sweet taste. It is also called 1,2-ethylene dichloride, dichloroethylene, or ethylene dichloride. It's most common use today is to make vinyl chloride and other chemicals and to dissolve grease, glue, and dirt. It is also added to leaded gasoline to remove lead. In the past, 1,2-dichloroethane was used in home products such as cleaning solutions and paint removers. It is rarely used in these products today. Its relative density (specific gravity) is 1.235 (water = 1.0).

No other VOCs, metals, PNAs or Pesticides were detected above TACO Tier 1 remediation objective for Class I groundwater.

Extent of VOCs in Groundwater

1,2-Dichloroethane was detected in the groundwater sample collected from soil boring/temporary monitoring well number SB-24/GW-2, which was located toward the northeast corner of the subject property. Phase I ESA findings indicate a paint-storage shed was situated in the vicinity of SB-24/GW-2. No VOCs were detected in the four other groundwater samples collected from the northern portion of the subject property. Therefore, the horizontal extent of 1,2-Dichloroethane is estimated to be limited to the area of SB-24/GW-2.

SB-24/GW-2 was advanced to a depth of 20 feet bgs. Soil observed within SB-24 and at other vicinity soil borings to similar depths indicates the general lithology of the subject property's subsurface to include sand to about 12 feet bgs, gray clay below 12 feet bgs and gray clay to a depth of at least 35 feet bgs. Gray clay often has a hydraulic conductivity between 1.0×10^{-10} cm/sec and 1.0×10^{-5} cm/sec. Therefore, although the specific gravity of 1,2-Dichloroethane would suggest that it is downwardly mobile, the presence of gray clay suggests a firm barrier to downward mobility of VOCs and suggests that elevated concentrations of 1,2-Dichloroethane would be limited to the sand layer and groundwater table at and above 12 feet bgs.

Concentrations of COCs in Groundwater

Concentrations of COCs detected within subject property groundwater and detected above TACO Tier 1 remediation objectives are summarized on Table 4.

One VOC, 1,2-Dichloroethane, was detected at a concentration of 0.017 mg/L, which is above its Class I groundwater remediation objective of 0.005 mg/L and below its Class II groundwater remediation objective of 0.025 mg/L.

Groundwater in the vicinity of the subject property is not used as a source of drinking; therefore, it is anticipated that the groundwater ingestion exposure route will be eliminated. The ROR will further discuss the elimination of exposure pathways and remediation objectives for the subject property. The ROR will likely include groundwater modeling for 1,2-Dichloroethane for the purpose of assessing its potential extent of impact.

4.4 SIGNIFICANT PHYSICAL FEATURES

No significant features of the subject property concerning contamination transport and risk to human health, safety and the environment are present. Although, as stated in Section 2.1.7, additional site investigation to delineate the horizontal extent of total and leachable lead is in progress at this time.

DOE engaged CTE in October 2002 to erect a 6-foot fence and locked gate along 76th Street and 78th Street in order to restrict access to the subject property.

4.5 COMPARISON OF CONCENTRATIONS OF COCs WITH TIER 1 OBJECTIVES

Results of laboratory analyses were compared to the corrective action objectives within the 35 Illinois Administrative Code Part 742, TACO, dated August 15, 2001 (742.Appendix B.Table B and others) and evaluated for residential property use.

Refer to Tables 1 through 6 for a summary of comparisons of detected COCs with Tier 1 remediation objectives.

5.0 CONCLUSIONS

The findings contained within this CSIR address the requirements of Title 35 IAC Part 740.415, 740.420 and 740.425. The CSIR's findings also address the SRP's comments pertaining to the subject property as outlined in their October 15, 2002 letter. Except for the on-going additional site investigation for total lead and leachable lead in the shallow subsurface, CTE considers the CSI for the subject property to be complete.

Specific conclusions include the following:

- Historical and Suspect USTs – Results of soil sample analyses, EM Survey and test pit excavations suggest that no significant impacts from former on-site USTs are present and that no USTs remain on-site.

If any evidence of USTs or impacts from USTs is discovered during site development, DOE will collect soil samples and conduct the appropriate removal as necessary.

- Former Site Operations – Section 1.0 of the CSIR describe the numerous historical on-site manufacturing and warehousing operations that occurred on-site for more than 100 years as identified in CTE's Report of Phase I ESA. CTE advanced over 50 soil borings and submitted over 100 soil samples for laboratory analysis of targeted and comprehensive chemical analyses within the footprint of and/or in the immediate vicinity of former on-site industrial operations, RECs and AOECs.

Laboratory analyses of soil samples included the comprehensive list of constituents (as stated Title 35 IAC Part 740.Appendix A), including metals and other COCs.

Select VOCs, SVOCs, total arsenic, total lead and leachable lead were detected at concentrations above the Tier 1 Ingestion, Inhalation, and SCGIR remediation objectives for residential property use and/or Construction Worker remediation objectives. Areas of elevated VOC impacts (i.e., above Inhalation remediation objectives) were horizontally and vertically defined, as were all other non-volatile COCs detected on-site.

Since future construction/re-development activities will be conducted on the subject property, CTE recommends that the subject property owner notify the re-development contractor of the results of these findings so that worker protection precautions may be taken.

- Groundwater – Five groundwater samples were collected to address the identified RECs and AOECs associated with the subject property. Laboratory results of one groundwater sample (SB-24/GW-2) indicated the presence of an elevated concentration of one VOC (1,2-Dichloroethane). 1,2-Dichloroethane was detected at a concentration of 0.017 mg/L, which is above its Class I groundwater remediation objective of 0.005 mg/L and below its Class II groundwater remediation objective of 0.025 mg/L.

CTE concludes that characterization of COCs in groundwater for the identified RECs and AOECs associated with the northern portion of the subject property has been completed. Groundwater in the vicinity of the subject property is not used as a source of drinking, therefore, it is anticipated that the groundwater ingestion exposure route will be eliminated in the ROR.

SRP's October 15, 2002 comments pertaining to the "southern portion" will be addressed in a separate CSIR, as DOE intends to register the "South Parcel" as a separate Remediation Site with the SRP. DOE has engaged CSI and remediation efforts for the South Parcel, which is in progress. Several RECs and AOECs were identified on the South Parcel in CTE's Phase I ESA however, no RECs or AOECs identified on the South Parcel are considered to be RECs or AOECs to the subject property.